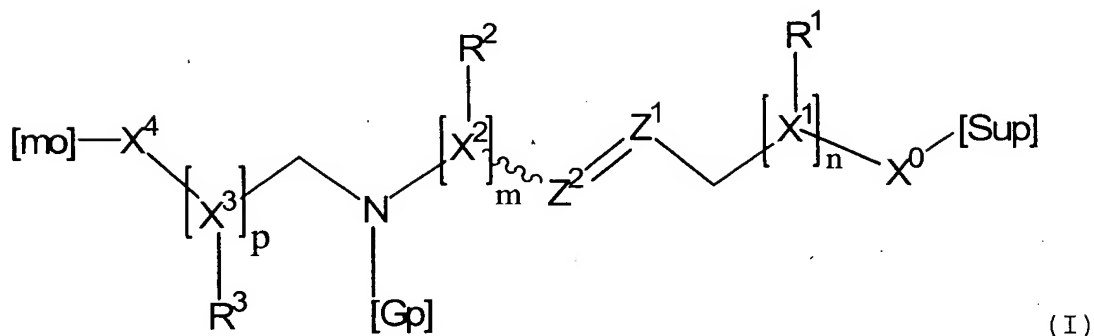


CLAIMS

1. Molecular spacer arm of formula (I) below:



5 - in which X^0 and X^4 are substituents which can be modulated so as to allow bonding of [mo] and [Sup] via said spacer arm, X^0 and X^4 being different from H and each being chosen, independently of the other substituents of the spacer arm, from C, O, N, S, Se, P, As and Si; and

 - in which the substituents X^1 ; X^2 ; X^3 ; Z^1 ; Z^2 ; R^1 ; R^2 ; and R^3 are such that:

- X^1 ; X^2 ; and X^3 are each chosen, independently of the other substituents, from C, O, N, S, Se, P, As and Si, and from an aryl and a heteroaryl, each containing from 2 to 20 carbon atoms;
- Z^1 and Z^2 are each chosen, independently of the other substituents, from C-R, Si-R, C, N, P and As, where R is an alkyl containing from 1 to 40 carbon atoms;
- R^1 ; R^2 ; and R^3 are each chosen, independently of the other substituents, from H, an alkyl, an aryl

and a heteroaryl each containing from 2 to 20 carbon atoms;

- [Gp] represents a group which protects the secondary amine -N- or a molecule which participates in the functionality of the spacer arm;

- in which n, m and p are integers, each greater than or equal to 1 and chosen independently of one another, preferably such that $1 \leq n, m \text{ and } p \leq 40$;

- in which [Sup] represents H or a silanized solid support to which said spacer arm can be covalently attached; and

- in which [mo] represents H or a molecular unit intended to be covalently attached by means of said spacer arm to said silanized solid support.

2. Spacer arm according to Claim 1, in which

- X^0 and X^4 are chosen, independently of the other substituents, from C, O, N, S and Si; and/or
- X^1 ; X^2 ; and X^3 are chosen, independently of the other substituents, from C, O, N, S and Si, and from an aryl and a heteroaryl each containing from 2 to 10 carbon atoms; and/or
- Z^1 and Z^2 are chosen, independently of the other substituents, from C, N, C-R and Si-R, where R is an alkyl containing from 1 to 30 carbon atoms; and/or
- R^1 ; R^2 ; and R^3 are chosen, independently of the other substituents, from H, an alkyl, an aryl and

a heteroaryl each containing from 2 to 10 carbon atoms.

3. Spacer arm according to Claim 1, in which
5 the protective group [Gp] is chosen from Ac, benzyl, a C₁ to C₄₀ aryl group, Troc, z, TCA, BOC and Fmoc.

4. Spacer arm according to Claim 1, in which
the solid support [Sup], when it is present, is chosen
10 from a plate, a bead or a capillary.

5. Spacer arm according to Claim 1 or 4, in which [Sup] is silica-based or glass-based.

15 6. Spacer arm according to Claim 1, in which [mo], when it is present, is a molecule having a molecular weight ranging from 180 to 400 000 g.mol⁻¹.

7. Spacer arm according to Claim 1, in which
20 [mo], when it is present, is chosen from monosaccharides, oligosaccharides, polyoligosaccharides, glycoconjugates, peptides, proteins, enzymes, glycoproteins, lipids, fatty acids, glycolipids and glycolipoproteins.

25 8. Spacer arm according to Claim 1, in which [mo], when it is present, is a sugar.

9. Use of a spacer arm according to any one of Claims 1 to 8, for attaching a molecular unit [mo] to a silanized solid support [Sup].

5 10. Use according to Claim 9, in which [mo] is a molecule having a molecular weight ranging from 180 to 400 000 g.mol⁻¹.

10 11. Use according to Claim 9, in which [mo] is chosen from monosaccharides, oligosaccharides, poly-oligosaccharides, glycoconjugates, and natural or synthetic small molecules; and [Sup] represents a silanized solid support to which the spacer arm can be attached.

15 12. Use according to Claim 9, in which [Sup] is chosen from a plate, beads or a capillary.

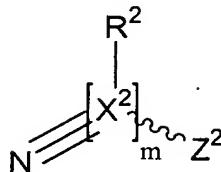
20 13. Use according to Claim 12, in which [Sup] is silica-based or glass-based.

 14. Use according to any one of Claims 9 to 13, for producing a biochip.

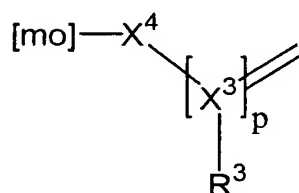
25 15. Use according to any one of Claims 9 to 13, for producing a glycochip.

30 16. Process for the covalent attachment of a molecular unit [mo] to a support by means of a spacer arm, said process comprising the following steps:

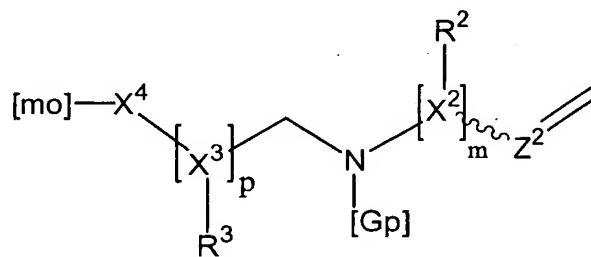
(i) reduction of the nitrile function of a compound of formula:



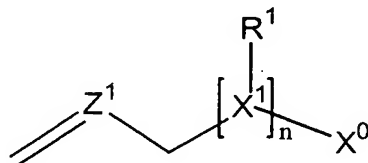
(ii) formation of an aldehyde function from an allyl function of a biological molecule of formula:



(iii) reductive amination, followed by protection of the secondary amine formed, between said reduced nitrile function and said aldehyde function, so as to obtain a biological molecule which has been activated so as to be attached to the support, said activated biological molecule being of formula:



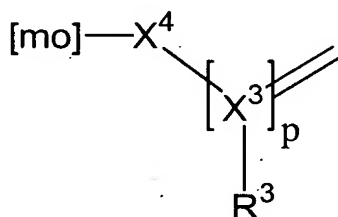
(iv) silanization of a solid support, and functionalization of the silanized solid support with a molecule of formula:



(v) metathesis reaction between the molecule functionalizing the support and the activated biological molecule so as to form a spacer arm according to the invention connecting the biological molecule and the support;

in which process the substituents X^0 ; X^1 ; X^2 ; X^3 ; X^4 ; Z^1 ; Z^2 ; R^1 ; R^2 ; R^3 ; and [mo] are as defined in Claim 1.

17. Process according to Claim 16, in which the compound of formula



is an allylated sugar, [mo] being said sugar.

18. Process according to Claim 16, in which [Sup] is chosen from a plate, a bead or a capillary.

19. Process according to Claim 16 or 18, in which [Sup] is silica-based or glass-based.

20. Process according to Claim 16, in which [mo] is a molecule having a molecular weight ranging from 180 to 400 000 g.mol^{-1} .

21. Process according to Claim 16, in which [mo] is chosen from monosaccharides, oligosaccharides,

polyoligosaccharides, glycoconjugates, peptides, proteins, enzymes, glycoproteins, lipids, fatty acids, glycolipids and glycolipoproteins.

5 22. Process according to Claim 16, in which [mo] is a sugar.

23. Process according to Claim 16, also comprising a step consisting of attachment of a
10 protective group [Gp] to the secondary amine function.

24. Process according to Claim 23, in which [Gp] is chosen from Ac, benzyl, a C₁ to C₄₀ aryl group, Troc, z, TCA, BOC and Fmoc.
15

25. Use of a process according to any one of Claims 16 to 24, for producing a biochip.

26. Use of a process according to any one of
20 Claims 16 to 24, for producing a glycochip.